

REMARKS

The application has been reviewed in light of the final Office Action dated May 28, 2008. Claims 1 and 14-22 were pending, with claims 2-13 having previously been canceled, without prejudice or disclaimer. By this Amendment, claim 1 has been amended, and claim 23 has been added. Accordingly, claims 1 and 14-23 are now pending and presented for continued examination, with claims 1, 16 and 22 being in independent form.

Claims 1, 14 and 16-19 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Maki et al. (US 2002/0126193 A1) in view of U.S. Patent No. 6,097,408 to Fukushima et al. Claims 15 and 20 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Maki in view of Fukushima and further in view of U.S. Patent No. 6,909,872 to Eskey and Kashiwagi et al. (US 2001/0028381 A1). Claim 21 was rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Maki and Fukushima et al. and further in view of Kashiwagi et al. (2001/0028381). Claim 22 was rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Maki and Fukushima et al. and further in view of Kawada et al. (JP 09-254460).

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claim 1 is patentable over the cited art, for at least the following reasons.

Maki, as understood by Applicant, proposes in Fig. 18 thereof (which was cited and reproduced in the Office Action) a recording-sheet conveying device (208) comprising a conveying belt (214), a pressing roller (215), conveyance guides (216), and a belt charging roller 219. The conveying belt 214 is wound around a driving roller (212) and a driven roller (213). The pressing roller 215 is pressed against a part of the conveying belt 214 wound around the

driving roller 212 so as to prevent the conveying belt 214 from slipping on the driving roller 212. The conveyance guides 216 are arranged between the driving roller 212 and the driven roller 213 along a stretch near the recording head 203. The belt charging roller 219 is arranged opposite the driving roller 212, and contacts the conveying belt 214 at a position upstream in a revolving direction of the driving roller 212 (that is, upstream from a position at which the recording sheet 17 separated and fed from the feeding tray 205a by a separating unit 218 contacts the conveying belt 214 wound around the driving roller 212). The driving roller 212 is connected to ground.

The connection of the drive roller 212 to ground as proposed by Maki is equated in the Office Action with a charge eliminating unit.

The ground connection proposed by Maki, for at least the following reasons, is not at all comparable to a charge eliminating unit that eliminates charge of a printing surface of the recording sheet:

(i) the connection of the drive roller 212 (which is provided in contact with an inner surface of the belt 208) to ground as proposed by Maki establishes a known potential on the inner surface of the belt 208 to facilitate controlled charging on the outer surface of the conveying belt (as explained in Fukushima, column 5, lines 50-57);

(ii) the ground connection as proposed by Maki does not come into direct contact with the recording medium;

(iii) the ground connection as proposed by Maki does not have the effect of eliminating a charge on the printing surface of the recording medium (requiring application of a complementary charge equal in magnitude and opposite in polarity, which is simply not provided by connection to ground); and

(iv) assuming *arguendo* (which applicant does **NOT** concede) that the ground connection

does eliminate charge, the conveying belt would become entirely discharged, thus eliminating any adherence effect between the recording medium and the conveying belt.

For at least the above reasons, one skilled in the art would **NOT** understand Maki as proposing a connection of the drive roller 212 to ground as a charge eliminating unit for removing the charge from the printing surface of the recording medium.

Further, Maki does not disclose or suggest that the charge eliminating unit is disposed on a downstream side of a position where the recording media is conveyed over the curvature of at least two rollers supporting the conveying belt.

The one figure in Maki showing the complete path of a recording medium in the system proposed by Maki, that is, Figure 1 of Maki, shows that the recording medium is to be separated from the conveying belt at a point before it reaches the curvature of the second roller. Maki simply does not disclose or suggest that the device should be arranged to convey the recording medium over the curvature of the second roller.

It is contended in the Office Action that Fukushima proposes that the charge eliminating unit is disposed on a downstream side of a position where the recording media is conveyed over the curvature of at least two rollers supporting the conveying belt. Dielectric brush 6a is equated in the Office Action with a charge eliminating unit.

Contrary to the contention in the Office Action that Figure 3A of Fukushima shows that the recording medium contact the conveying belt at a point along the curvature of the right-most roller, neither the written description nor the drawings of Fukushima disclose or suggest such feature.

Figure 3A of Fukushima depicts the recording medium (10) being fed by resisting rollers 13 through guides 18 onto the conveyor belt 1 at a point along the flat section of the belt above

the roller. The upper and lower outlines of the recording medium in Figure 3A of Fukushima show no curved portion to suggest, as contended in the Office Action, that the recording medium is in contact with the curvature of the conveying belt.

Fukushima does not disclose or suggest configuring the imaging device so as to place the recording medium in contact with the curvature of the first roller nor why such configuration might be advantageous. It would not have been obvious from Fukushima to configure the image forming apparatus to place the recording medium in contact with the curvature of the at least two rollers.

Moreover, none of the cited references discloses or suggests an image forming apparatus including a charging unit provided in the conveyance unit and configured to receive a first AC bias voltage and apply a charge, based on the first AC bias voltage, to a surface of the conveyance belt, a charge eliminating unit eliminating configured to receive a second AC bias voltage and eliminate charge of a printing surface of the recording sheet, the charge eliminating unit being disposed at a position on a downstream side of the charging unit in the movement direction of the conveyance unit and on an upstream side of the head unit, and an AC bias supplying unit configured to supply said first and second AC bias voltages at selected timings.

Applicant submits that the cited art, even when considered along with common sense and common knowledge to one skilled in the art, does **NOT** render unpatentable such aspect of claim 1 of the present application.

Further, none of the cited art disclose or suggest configuring the image forming apparatus such that a movement distance of the conveyance unit from the charging unit to the charge eliminating unit is represented by a distance that is obtained by subtracting $(1/2)X$ from an integral multiple of X where X denotes a charging period length from a positively charged

portion of the conveyance unit to a negatively charged portion of the conveyance unit (claim 16 of the present application).

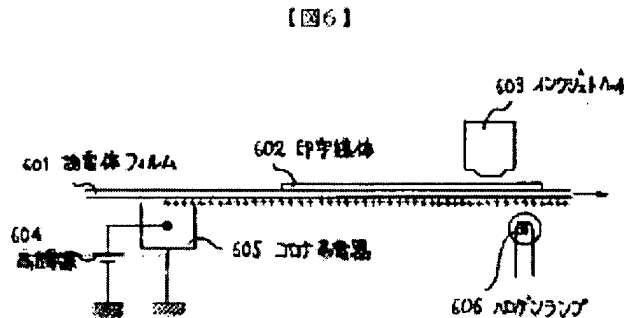
As discussed in the application, the charge eliminating unit is provided to eliminate the charge on the printed surface of the recording medium only and not to eliminate the charge used for attraction, and when the charge eliminating unit is properly positioned relative to the charging unit, the charge on the conveying belt side of the recording medium remains in tact and is even enhanced by the action of the charge eliminating unit on the opposite surface of the recording medium (see paragraph [0106] of the application). Such positioning also facilitates synchronization of the polarity of the AC bias applied to the charge eliminating unit with the movement of the conveying belt.

It is alleged in the Office Action that it would have been obvious to control the charging timing or otherwise obtain synchronization.

However, it is respectfully submitted that the present application does not claim as its invention all modes of synchronization. Instead, the approach that is claimed in claim 16 of the present application provides that a movement distance of the conveyance unit from the charging unit to the charge eliminating unit is represented by a distance that is obtained by subtracting $(1/2)X$ from an integral multiple of X where X denotes a charging period length from a positively charged portion of the conveyance unit to a negatively charged portion of the conveyance unit. Such approach is simply not obvious (indeed, the Office Action apparently expresses the Examiner's belief that one skilled in the art would have arrived at a different formulation).

In addition, applicant submits that claim 22 of the present application is likewise not obvious from the cited art.

Kawada, as understood by Applicant, proposes a paper transport mechanism wherein a rear face (that is away from the print head) of the print medium is attracted by an electrostatic suction plate. Fig. 6 (reproduced below) of Kawada was cited in the Office Action.



In the apparatus shown in Fig. 6 of Kawada, power supply 604 supplies device 605 with the charge to charge dielectric film 601 in order to facilitate attraction of printing medium 602 to the film 601. Halogen lamp 606 is strategically positioned slightly upstream of the print head, in order to dry the ink promptly after it is deposited by the print head on the printing medium.

No charge elimination unit is disclosed or suggested in Kawada in conjunction with the lamp. The lamp is not included to affect the charge of any recording medium or conveying belt and no suggestion is made to this effect. Kawada does not disclose or suggest that a lamp or heating unit may be used to enhance the effect of either a charging unit or a charge eliminating unit. Further, no disclosure or suggestion is made in Kawada that the lamp or heating unit should be placed upstream from the charge elimination unit and upstream of the head unit.

None of the cited references discloses or suggests providing an image forming apparatus with a heating unit disposed at a position on an upstream side of the charge eliminating unit in the movement direction of the conveyance unit (claim 22 of the present application).

Applicant submits that the cited art, even when considered along with common sense and common knowledge to one skilled in the art, does **NOT** render unpatentable such aspect of claim

22 of the present application.

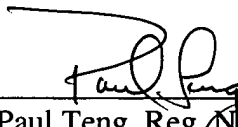
Accordingly, applicant respectfully submits that independent claims 1, 16 and 22, and the claims depending therefrom, are patentable over the cited art.

In view of the remarks hereinabove, Applicant submits that the application is now in condition for allowance, and earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any fees that are required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



Paul Teng, Reg. No. 40,837
Attorney for Applicant
Cooper & Dunham LLP
Tel.: (212) 278-0400